Kingdom Animalia (Invertebrates)

Character	Porifera	Cnidaria	Platyhelminthes	Aschelminthes	Annelida	Mollusca	Arthropoda	Echinodermata
Symmetry	Asymetrical	Radial	Bilateral	Bilateral	Bilateral	Bilateral & Asymmetry	Bilateral	Bilateral & Radial
Cavity	Spongocoel	Coelonteron	Acoelomate	Pseudocolomates	Coelomates	Coelom	Hemocoel	Coelom
Habitat	Aquatic	Aquatic	Freshwater or Parasitic	Free living or Endoparasites	Aquatic & terrestrial	Aquatic & terrestrial	Air, water & soil	Aquatic(Marine)
Body Layers	Pinacoderm, Mesenchyme, Choanoderm,	Diploblastic	Triploblastic	Triploblastic	Triploblastic	Triploblastic	Triploblastic	Triploblastic
Digestion	Detritus, Zooplankton & Phytoplankton	Sac type	Sac type or absent in parasites e.g (Tapeworm)	Tube within tube	Tube like digestive system	Tube like, **Radula** a tongue like structure	Tube like and specialized	Tube like lower oral and upper aboral end
Respiration	No system	No system	No system	No system	No system	Gills & lungs	Tracheae, Book lungs and gills	No system
Excretion	No system	No system	Protonephridia	Excretory canals	Paired Nephridia	Nephridia	Malpighian tubules	No system
Nervous Sys.	Sensory Cells	Diffused	Centralized (Nerves and ganglia)	CNS & Papillae as sensory organs	CNS, Brain, Double Ventral nerve cord	Three pairs of ganglia	Paired ganglia and double ventral nerve cord	Poorly organized, Nerve ring around pharynx
Circulation	No system	No system	No system	No system	Closed	Open & Close	Open	Poorly developed
Skeleton	Spicules, Siliceous or calcareous	Exoskeleton of $CaCO_3$	No system	No system	Hydrostatic	Calcareous secreted by **mantle**	Exoskeleton and chitinous	Mesodermal endoskeleton
Reproduction	Sexual Hermaphrodite, Asexual, Budding (Gemmules)	Sexually, Hermaphrodite, Asexual, Budding	Hermaphrodite, regeneration and fission	Separate sexes	Sexual, Hermaphrodite (Earthworm) or separate sexes *(Neries)*	Sexual, separate sexes	Separate sexes and sexual, Metamorphosis	Separate sexes
Larval Form	Free swimming	Free Swimming			Trochophore	Trochophore larva	Larva, nymph or instar	Bippinaria and Brachiolaria
Movement	Non motile	Motile or sessile	Motile or sessile	Dorsolateral and ventrolaterl muscles	Circular and longitudinal muscles	Muscular foot	Walking or flight	Water vascular system
Examples	*Spongilla, Leucoselenia, Spongilla, Euplectella*	*Hydra, Obelia*, Sea anemone, *Madrepora,*	Planaria, Tapeworm, Liver fluke and Blood fluke	*Ascaris, Rhabditis, Entrobius, Ancylostoma*	Polychaetae (*Neries*), Oligochaetae (Earthworm) & Hirudinea(Leech)	Gastropoda (Snail, Slug), Bivalvia (Mussels and oyster), Cephalopoda (Squid & cuttlefish)	Crustacea(Crab,prawan), Insecta (Flies, Bees), Arachnida (Spiders), Myiapoda (Centipedes & millipedes)	Sea star, brittle star, sea cucumber
Importance	Washing and bathing, Absorption of sound and fluids	Coral formation	Endoparasites and have more than one host	Endoparasites of human	Earthworm as farmer friend & medicinal leech (*Hirudo medicinalis*)	Edible, Shells in tar and buttons, Pearl formation & Injurious to garden and ships	Harmful(Mosquito, Flies, Tse tse fly, locusts) Useful(Honey bee, silkworm, butterflies and scavenger insects)	Highest power of regeneration and evolutionary link to chrordates

Kingdom Animalia(Chordata)

Character	Pisces			Amphibia	Reptilia	Aves	Mammalia
	Cyclostomata	**Chondrichthyes**	**Osteichthyes**	Aanamniotes, cold blooded	Amniotes and cold blooded	Lack bladder in excretory system	Highest brain capacities
Body	Long and eel like	Fusiform body	Stream lined body	Variable with or without tail	Streamlined	Stream lind, with four divisions head, neck, trunk and tail	With hairs and mammary glands
Movement	No paired appendages	No swim bladder enlarges pectoral fins	Fins and swim bladder	Tetrapod limbs or legless (Caecelians), webbed feet	Better developed limbs for efficient locomotion	Flight and walking	Limbs
Digestion	Lacks stomach Ventral sectorial mouth	J shaped stomach, Ventral mouth & olfactory sacs not connected	Terminal mouth, teeth may be found	Tube like and complete	Complete digestive system	No teeth but have gizzard for crushing food	Complete and specialized, two sets of teeth
Respiration	6-14 pairs of gills	5-7 pairs of gills	4-5 pairs of gills, operculum present	Gills in larva & lungs in adults, metamorphosis	Lungs	Syrinx for voice, Lungs, extended to form air sacs, have parabrpnchi and one way air flow	Lungs & larynx at the top of taraches
Circulation	Single circuit & Heart with one auricle	Single circuit & Multiple aortic arches	Single circuit with one auricle and one atrium	Three chambered heart and double circuit circulation	Four chambered heart	Four chambered heart and double circuit circulation, right aortic arch	Four chambered heart and left aortic arch, Non nucleated RBCs
Skeleton	Cartilaginous and scales absent	Cartilaginous and Placoid scales	Bony, Cycloid, Ganoid or ctenoid scales	Bony skeleton, smooth skin with glands and chromatophores, scales absent	Bony endo, Dry scaly skin	Epidermal exoskeleton, feathers, scales on legs, hollow bones, large skull sockets, jaws extend to form a beak	Bony Endoskeleton & two body cavities due to diaphragm, inner ear ossicles
Reprodution	Sexual, separate sexes lampreys, hag fishes are hermaphrodite	Sexual & separate sexes, oviparous or viviparous	Separate sexes external fertilization	Separate sexes, external fertilization	Copulatory organ for internal fertiliazation, oviparous, large yolky eggs	Separate sexes, internal usually without copulatory organ, only one ovary and oviduct is functional	Separate sexes, Viviparous, internal fertilization
Examples	Hag fish and lamprey	Skate, Rays and Sharks	Perch, trout, Palaice	Frog, toad , salamander	Lizard, snake, sphenodon, crocodiles	Ostrich, Kiwi, Robin, Kestel, kingfisher , sparrow, Mallard	1. Prototheria or egg laying (Duck bill and platypus) 2. Metatheria or pouched (kangroo, opossum and tasmanian wolf), 3. Eutheria (placental mammals, human, whale, elephant , horse, rat, mice , bat & dolphin)
Importance	Primitive chordates	Predator, Food, source of vit A and D by liver oil	Important in food chain, Biodiversity, Developed into dipnoi	Food chain, biodiversity	Adapted to land	Food chain, evolved from archaeopteryx	

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